

CLAIMS

1. A safety syringe, comprising:

a hollow body, said body being of a first predetermined length and having
 an outer surface, a first end, a second end, cylindrical bore of a first
 predetermined diameter and means for gripping the hollow body
 adjacent the second end;

said first end including an opening of the first predetermined diameter;

said second end including a cavity extending from the cylindrical bore and
 terminating in an outlet portion, said outlet portion having a first
 end, a center section and a second end and being fixedly attached at
 its first end to the cavity;

said outlet portion including an orifice of a second predetermined diameter,
 said orifice extending outwardly from said cavity;

a hollow needle, said needle having a first end and a second end and being
 fixedly attached at its first end to the second end of the outlet portion
 such that fluid may travel from the cylindrical bore, through the
 cavity, through the outlet portion and through the needle;

a plunger, said plunger having a longitudinal shaft longer than the first
 predetermined length, a first end and a second end, a thumb pad
 fixedly attached to the first end of said shaft, and a piston, said
 piston being formed of a resilient material, attached to the second
 end of said shaft, and being sized and shaped to fit sealably within
 the cylindrical bore of the hollow body;

a needle shield, said shield having an outer surface, a first end, a second end, and being sized and shaped to fit slidably over the needle and at least a portion of the hollow body of the syringe;

means for securing the needle shield at its first end to the hollow body in a first position, said first position permitting the second end of the needle to extend outwardly from the second end of the shield and in a second position in which the second end of the needle shield extends beyond the second end of the needle;

means for moving the needle shield from the first position to the second position using a single hand; and

means for containing any fluid leaking from the second end of the needle within the needle shield when the shield is secured to the hollow body in the second position.

2. A safety syringe as described in Claim 1, wherein the means for securing the needle shield at its first end to the hollow body in first and second positions further comprises:

a first surrounding groove, said first groove disposed upon the outer surface of the hollow body adjacent its second end;

a second surrounding groove, said second groove disposed upon the outer surface of the hollow body adjacent its first end;

an engaging finger, said finger being formed of resilient material and having
 an upper surface, a lower surface, an activating end, an attaching end
 and a pivot point disposed between said ends;

a securing tooth, said tooth having an upper end and a lower end and being
 5 fixedly attached at its upper end to the lower surface of the engaging
 finger adjacent the attaching end;

said securing tooth being sized, shaped and disposed to removably engage
 one of the first and second surrounding grooves on the hollow body;

a mounting post, said post having an upper end, a lower end and being
 10 fixedly mounted at its lower end to the outer surface of the needle
 shield adjacent its first end;

said post being fixedly attached at its upper end to the lower surface of the
 engaging finger at the pivot point such that the resilient material of
 the engagement finger will bias the securing tooth downwardly to
 15 removably engage one of the first and second surrounding grooves;
 and

whereby, when pressure is applied to the upper surface of the engaging
 finger adjacent its activating end the securing tooth will pivot
 upwardly away from one of the first and second securing grooves,
 20 thereby permitting the needle shield to move slidably from the first
 position to the second position and when the securing tooth is
 positioned over one of the first and second securing grooves and
 pressure is relieved from the upper surface of the engaging finger the

securing tooth will engage one of said grooves, thereby preventing further movement of the needle shield.

3. A safety syringe as described in Claim 1, wherein the means for moving the needle shield from the first position to the second position using a single hand further comprises an indentation, said indentation being disposed upon the outer surface of the needle shield adjacent its first end and being sized and shaped to engage a finger pad of a user.

4. A safety syringe as described in Claim 1, wherein the means for containing any fluid leaking from the second end of the needle within the needle shield when the shield is secured to the hollow body in the second position further comprises:

a sealing membrane, said membrane being fixedly attached to the second end of the needle shield and permitting the hollow needle and the second end and center section of the outlet portion to pass through the membrane when the needle shield is in the first position; and said sealing membrane being capable of sealing the second end of the needle shield when the shield is in the second position with the hollow needle and outlet portion withdrawn within the shield.

5. A safety syringe as described in Claim 1, wherein the means for containing any fluid leaking from the second end of the needle within the needle shield when the shield is secured to the hollow body in the second position further comprises:

a sealing membrane, said membrane being fixedly attached to the second end of the needle shield and permitting the hollow needle to pass through the membrane when the needle shield is in the first position; and

5 said sealing membrane being capable of sealing the second end of the needle shield when the shield is in the second position with the hollow needle withdrawn within the shield.

6. A safety syringe as described in Claim 1, wherein the needle shield is formed of a
10 resilient material and the means for containing any fluid leaking from the second end of the needle within the needle shield when the shield is secured to the hollow body in the second position further comprises:

 a flattened closure means formed at the second end of the needle shield, said
 closure means having a pair of mating lips at said second end, said
15 lips permitting the hollow needle and the second end and center section of the outlet portion to pass there between when the needle shield is in the first position; and

 said lips being capable of sealing the second end of the needle shield when
 the shield is in the second position with the hollow needle and outlet
20 portion withdrawn within the shield.

7. A safety syringe as described in Claim 1, wherein the needle shield is formed of a resilient material and the means for containing any fluid leaking from the second

end of the needle within the needle shield when the shield is secured to the hollow body in the second position further comprises:

a flattened closure means formed at the second end of the needle shield, said closure means having a pair of mating lips at said second end, said lips permitting the hollow needle to pass there between when the needle shield is in the first position; and said lips being capable of sealing the second end of the needle shield when the shield is in the second position with the hollow needle withdrawn within the shield.

8. A safety infusion set, comprising:

a length of flexible tubing, said tubing having a first end and a second end;
 a hollow catheter body, said body having a first end, a second end, an outer surface and an extended outlet portion, and being fixedly attached at its first end to the first end of the tubing;
 a pair of attachment wings, said attachment wings being fixedly attached to the outer surface of the catheter body;
 said outlet portion having a first end, a center section and a second end and being fixedly attached at its first end to the second end of the catheter body;
 a connection fitting attached to the second end of the tubing;
 a hollow needle, said needle having a first end and a second end and being fixedly attached at its first end to the second end of the outlet portion such that fluid may pass from the flexible tubing, through the

catheter body and the outlet portion and outwardly through the
hollow needle;
a needle shield, said shield having an outer surface, a first end, a second
end, and being sized and shaped to fit slidably over the needle, the
outlet portion and at least a portion of the catheter body;
said needle shield having a cylindrical portion commencing at the second
end of the shield, said cylindrical portion having an outer end and an
inner end and being sized and shaped to fit over the outlet portion,
and a slotted portion, said slotted portion having a longitudinal slot,
extending from the inner end of the cylindrical portion toward the
first end of the shield, said slotted portion being sized and shaped to
fit slidably over the hollow catheter body with said slot
accommodating an intersection of the wings and the catheter body;
means for securing the needle shield at its first end to the catheter body in a
first position, said first position permitting the second end of the
needle to extend outwardly from the second end of the shield and in
a second position in which the second end of the needle shield
extends beyond the second end of the needle;
means for moving the needle shield from the first position to the second
position using a single hand; and
means for containing any fluid leaking from the second end of the needle
within the needle shield when the shield is secured to the catheter
body in the second position.

9. A safety infusion set as described in Claim 8, wherein the means for securing the needle shield at its first end to the catheter body in first and second positions further comprises:

5 a first surrounding groove, said first groove disposed upon the outer surface of the catheter body adjacent its second end;

a second surrounding groove, said second groove disposed upon the outer surface of the catheter body adjacent its first end;

an engaging finger, said finger being formed of resilient material and having

10 an upper surface, a lower surface, an activating end, an attaching end and a pivot point disposed between said ends;

a securing tooth, said tooth having an upper end and a lower end and being fixedly attached at its upper end to the lower surface of the engaging finger adjacent the attaching end;

15 said securing tooth being sized, shaped and disposed to removably engage one of the first and second surrounding grooves on the catheter body;

a mounting post, said post having an upper end, a lower end and being fixedly mounted at its lower end to the outer surface of the needle shield adjacent its first end;

20 said post being fixedly attached at its upper end to the lower surface of the engaging finger at the pivot point such that the resilient material of the engagement finger will bias the securing tooth downwardly to

removably engage one of the first and second surrounding grooves;
and

whereby, when pressure is applied to the upper surface of the engaging
finger adjacent its activating end the securing tooth will pivot
upwardly away from one of the first and second securing grooves,
thereby permitting the needle shield to move slidably from the first
position to the second position and when the securing tooth is
positioned over one of the first and second securing grooves and
pressure is relieved from the upper surface of the engaging finger the
securing tooth will engage one of said grooves, thereby preventing
further movement of the needle shield.

10. A safety infusion set as described in Claim 8, wherein the means for moving the
needle shield from the first position to the second position using a single hand
further comprises an indentation, said indentation being disposed upon the outer
surface of the needle shield adjacent its first end and being sized and shaped to
engage a finger pad of a user.
11. A safety infusion set as described in Claim 8, wherein the means for containing any
fluid leaking from the second end of the needle within the needle shield when the
shield is secured to the catheter body in the second position further comprises:
a first sealing membrane, said first membrane being fixedly attached to the
outer end of the cylindrical portion of the needle shield and
permitting the hollow needle and the second end and center section

of the outlet portion to pass through the membrane when the needle shield is in the first position;

a second sealing membrane, said second membrane being fixedly attached to the inner end of the cylindrical portion of the needle shield and permitting the hollow needle and the second end and center section of the outlet portion to pass through the membrane when the needle shield is in the first position;

said first sealing membrane being capable of sealing the outer end of the cylindrical portion of the needle shield when the shield is in the second position with the hollow needle positioned within the cylindrical portion; and

said second sealing membrane being capable of sealing the inner end of the cylindrical portion of the needle shield about the needle when the shield is in the second position with the outlet portion positioned within the slotted portion of the shield.

12. A safety infusion set as described in Claim 8, wherein the means for containing any fluid leaking from the second end of the needle within the needle shield when the shield is secured to the catheter body in the second position further comprises:

a first sealing membrane, said first membrane being fixedly attached to the outer end of the cylindrical portion of the needle shield and permitting the hollow needle to pass through the membrane when the needle shield is in the first position;

a second sealing membrane, said second membrane being fixedly attached to the inner end of the cylindrical portion of the needle shield and permitting the hollow needle to pass through the membrane when the needle shield is in the first position;

5 said first sealing membrane being capable of sealing the outer end of the cylindrical portion of the needle shield when the shield is in the second position with the hollow needle positioned within the cylindrical portion; and

10 said second sealing membrane being capable of sealing the inner end of the cylindrical portion of the needle shield about the needle when the shield is in the second position with the outlet portion positioned within the slotted portion of the shield.

13. A safety infusion set as described in Claim 8, wherein the needle shield is formed
15 of a resilient material and the means for containing any fluid leaking from the second end of the needle within the needle shield when the shield is secured to the catheter body in the second position further comprises:

20 a flattened closure means formed at the outer end of the cylindrical portion of the needle shield, said closure means having a pair of mating lips at said outer end, said lips permitting the hollow needle and the second end and center section of the outlet portion to pass there between when the needle shield is in the first position;

a sealing membrane, said membrane being fixedly attached to the inner end
 of the cylindrical portion of the needle shield and permitting the
 hollow needle and the second end and center section of the outlet
 portion to pass through the membrane when the needle shield is in
 the first position;

said lips being capable of sealing the outer end of the cylindrical portion of
 the needle shield when the shield is in the second position with the
 hollow needle positioned within the cylindrical portion; and
 said sealing membrane being capable of sealing the inner end of the
 cylindrical portion of the needle shield about the needle when the
 shield is in the second position with the outlet portion positioned
 within the slotted portion of the shield.

14. A safety infusion set as described in Claim 8, wherein the needle shield is formed
 of a resilient material and the means for containing any fluid leaking from the
 second end of the needle within the needle shield when the shield is secured to the
 catheter body in the second position further comprises:

a flattened closure means formed at the outer end of the cylindrical portion
 of the needle shield, said closure means having a pair of mating lips
 at said outer end, said lips permitting the hollow needle to pass there
 between when the needle shield is in the first position;

a sealing membrane, said membrane being fixedly attached to the inner end
 of the cylindrical portion of the needle shield and permitting the

hollow needle to pass through the membrane when the needle shield
is in the first position;

said lips being capable of sealing the outer end of the cylindrical portion of
the needle shield when the shield is in the second position with the

5 hollow needle positioned within the cylindrical portion; and

said sealing membrane being capable of sealing the inner end of the
cylindrical portion of the needle shield about the needle when the
shield is in the second position with the outlet portion positioned
within the slotted portion of the shield.

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